

Claims

- [c1] 1. A method for controlling the manufacture of a spray-formed metallic tool, comprising:
applying a metallic spray-forming material upon a mold substrate in the manufacture of a spray-formed tool, and
controlling metallic phase transformations of the spray-forming material via a manipulation of temperature and time maintained at a predetermined temperature of the spray-formed tool during application of the spray-forming material.
- [c2] 2. The method of claim 1, wherein controlling the metallic phase transformations further comprises causing the occurrence of preselected phase transformations of the spray-forming material via the manipulation of temperature and time maintained at the predetermined temperature.
- [c3] 3. The method of claim 2, wherein causing the occurrence of the preselected phase transformations further comprises causing a predetermined strategic volumetric expansion associated with the preselected phase transformations via the manipulation of temperature and time maintained at the predetermined temperature.
- [c4] 4. The method of claim 3, wherein causing the predetermined strategic volumetric expansion associated with the preselected phase transformations further comprises causing preselected phase transformations to a mixed-phase makeup consisting of at least martensite and bainite in predetermined proportions via the manipulation of temperature and time maintained at the predetermined temperature.
- [c5] 5. The method of claim 4, wherein causing the predetermined strategic volumetric expansion associated with the preselected phase transformations further comprises causing preselected phase transformations to a mixed-phase makeup consisting of at least martensite, bainite, and pearlite-ferrite in predetermined proportions via the manipulation of temperature and time maintained at the predetermined temperature.

selected from a group of spray forming parameters consisting of a voltage setting in a spray gun applying the spray-forming material, a speed of the spray gun, a size of the spray gun, a distance between the spray gun and the substrate, and an initial temperature of the substrate.

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